As mentioned earlier, this directly impacts the assumption of the boundary conditions as well as the K-factor. If the connection can accommodate some level of moment transfer, then the current design assumptions are revisited. The experimental program includes compression and shear testing of bearing pads typically used by NCDOT in girder-cap beam arrangements. Prototype testing includes 42 tests on three different foundation configurations: (1) Pre-stressed concrete pile; (2) Steel tube pile; (3) H-pile. Each of these is tested with two different elastomeric bearing pads. These are Type V bearing pads for a steel superstructure, and Type VI pads for a concrete superstructure. The connection is tested simulating field conditions of NCDOT bridges. Two AASHTO Type II girders made continuous with a diaphragm are utilized in the testing program. The two different sets of bearing pads are used with the three different pile configurations. The axial load is varied in the bearing pads and test piles/shafts while lateral loading is applied in one-cycle increments of displacements.

It should be noted that, in the transverse direction, NCDOT currently assumes a K value of 1.4, which indicates the fixity of the connection. Such an assumption seems to be valid in that direction, and no investigation is focused on the behavior in the transverse direction. Furthermore, POT and TFE bearing pads are not included in this investigation as NCDOT does not use a diaphragm to connect adjacent girders with these types of bearings. Without a diaphragm, such connections will not transfer moment, and a K factor of 2.1 is deemed appropriate in the longitudinal direction.

(4) **LRFD Implementation.** Development of resistance factors based on drilled shaft testing data from North Carolina sites is performed. The factors are implemented using FB MultiPier. The results in terms of design length of the shafts are compared with current practice. Key differences are highlighted to assist in the transition of NCDOT engineers to AASHTO LRFD design approach.

(5) **Development of Limit States**. Currently, NCDOT practice utilizes a limit of one inch lateral displacement to assess shaft performance and decide upon the shaft length. Utilizing the analytical models developed in Task 2 and the results of the experimental